

### ***Remarks***

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1, 3 and 8 are pending in the application, with claim 1 being the independent claim. Support for the amendments to claims 1 and 3 can be found on page 2, lines 3-4 of the specification as filed. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

### ***Description of the Invention***

The present invention relates to, *inter alia*, the use of 2,2-dimethyl-3-(2,4-dichlorophenyl)-2-oxo-1-oxaspiro[4,5]dec-3-en-4-yl butanoate (compound I) for controlling acarids in hops, soft fruit selected from the group consisting of currant, gooseberry, raspberry, blackberry, strawberry and blueberry, or conifers, wherein the conifers are selected from the group consisting of spruces and firs, and wherein the compound of formula (I) is applied at a concentration of 0.0048% active ingredient per hectare to 0.0144% active ingredient per hectare.

### ***Rejections under 35 U.S.C. § 112, first paragraph***

Rejection of claims 1 and 3 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement is respectfully traversed. The Office alleges that the specification lacks support for the term "berries," because the specification lists the berries "currant, gooseberry, raspberry, blackberry, strawberry, blueberry." Applicants respectfully disagree.

Without acquiescing to the rejection, and solely in order to expedite prosecution, Applicants have amended claims 1 and 3 to recite the specific soft fruits "currant, gooseberry, raspberry, blackberry, strawberry, blueberry." Applicants respectfully request that the rejection be withdrawn.

***Rejection under 35 U.S.C. § 112, second paragraph***

Rejection of claim 8 under 35 U.S.C. § 112, second paragraph, as allegedly having insufficient antecedent basis for the terms "spruces" or "firs" is respectfully traversed. Claim 8 depends directly from independent claim 1, and the Office alleges that claim 1 "claim 1, which recites conifers [] makes no mention of either spruces or firs." Office Action, p. 4. Applicants respectfully disagree. Claim 1 recites the phrase "wherein the conifers are selected from the group consisting of spruces and firs" and therefore provides sufficient antecedent basis for the terms "spruces" or "firs." Applicants respectfully request that the rejection be withdrawn.

***Rejection of claims 1 and 3 under 35 U.S.C. § 103***

The rejection of claims 1 and 3 under U.S.C. § 103(a) as allegedly being obvious over Wachendorff *et al.*, *BCPC Conf. - Pests Dis. 1:53-58* (2000) ("Wachendorff"), as evidenced by evidence by a Wikipedia article, entitled "Berry" at <http://en.wikipedia.org/wiki/Berry> ("Wikipedia"), is respectfully traversed.

The Office has cited the disclosure in Wachendorff that discusses using spirodiclofen on crops such as citrus, stone and pome fruits, grapes and nuts. Wachendorff, Abstract. The Office states that, because grapes are "botanical berries" and citrus fruits are "modified berries," Wachendorff allegedly teaches the application of spirodiclofen to berries to control acarids. Applicants respectfully disagree.

Applicants have amended claims 1 and 3 to replace the term "berries" with "soft fruit selected from the group consisting of currant, gooseberry, raspberry, blackberry, strawberry and blueberry." Wachendorff does not indicate the use of spiroadiclofen for controlling acarids on soft fruits selected from the group consisting of currant, gooseberry, raspberry, blackberry, strawberry and blueberry. Additionally, Wachendorff does not provide any guidance on the concentration of spiroadiclofen needed to effectively control mites on the claimed soft fruit. A person of ordinary skill in the art reading Wachendorff would therefore not have a reasonable expectation of achieving acaricidal activity upon applying spiroadiclofen at the instantly claimed concentrations to the claimed soft fruit.

Furthermore, the acaricidal activity of spiroadiclofen in one crop is not necessarily indicative of success of acaricidal activity in other crops. For example, chemical control of spruce spider mites is difficult because good spray coverage is essential for good control. Sidebottom, "Christmas Tree Notes, Spruce Spider Mite on Fraser Fir," *NC State University Cooperative Extension*, pp. 1-7, (updated 2009), (Exhibit A) ("Sidebottom"), at page 5, right hand column, lines 3-5. The art as a whole therefore establishes unpredictability with respect to control of mites.

Even assuming, *arguendo*, that a *prima facie* case of obviousness has been established, which it has not, the unexpected results exhibited by the claimed invention is sufficient to rebut a *prima facie* case of obviousness.

Applicants submit herewith a Declaration under 37 C.F.R. § 1.132 of John Bell ("Bell Declaration") and a Declaration under 37 C.F.R. § 1.132 of Robert Brinkmann ("Brinkmann Declaration"), which demonstrate the higher activity of spiroadiclofen in

some crops in comparison to another crop. Example 1 and 7 are the same as Examples A and B, respectively, of the captioned specification as filed. The Bell Declaration and the Brinkmann Declaration recite the results of applying spiroticlofen to hops, strawberry and cotton crops.

The acaricidal activity of spiroticlofen is much higher in hops when compared to cotton. *See*, Declaration, Example 1 and Example 4. Spiroticlofen (also known as 240 SC) applied to hops at a concentration of 0.0048 % active ingredient per hectare (equivalent to 96 grams per hectare) produced an acaricidal efficacy of greater than or equal to 90% even at 21 days after treatment. *Id.*, Example 1. By contrast, a higher application rate of 150 grams per hectare in cotton resulted in a much lower efficacy of 58% at 21 days after treatment. *Id.*, Example 4.

Spiroticlofen has a higher activity in hops as compared to cotton, when applied at a similar application rate. *See*, Declaration, Examples 7, 8 and 9. An application rate of 0.0144 % active ingredient per hectare (equivalent to about 320 grams per hectare) in hops yielded a 99.6 % acaricidal efficacy of at 19 days after application. By contrast, an application rate of 330 grams per hectare in cotton yielded less than half of the acaricidal efficacy (44 %) compared to hops at 21 days after application, or an efficacy of 30 % at 14 days after application at 330 grams per hectare. *Id.*

The Declaration also demonstrates the unexpectedly higher activity of spiroticlofen in strawberries compared to cotton. When spiroticlofen is applied to strawberries at a concentration of 210 grams per hectare, it exhibits an efficacy of 100 % at 12 days after application. *Id.* Example 3. By contrast, when spiroticlofen is applied

to cotton at a concentration of 330 grams per hectare, it exhibits a much lower efficacy of 20 % after 14 days. *Id.*, Example 8.

For the reasons set forth above, Applicants respectfully request that the Office reconsider the evidence of unexpected activity presented in the specification and in the Declaration, and that the rejection of claims 1 and 3 under 35 U.S.C. § 103(a) be withdrawn.

***Rejection of claim 8 under 35 U.S.C. § 103***

The rejection of claim 8 as allegedly being obvious over Wachendorff, as evidenced by Wikipedia, in view of U.S. Patent No. 5,262,383 to Fischer *et al.* ("Fischer") and Weidhaas, "Spider mite and other acarina on trees and shrubs," *Journal of Arboriculture* 5(1):9-15 (1979) ("Weidhaas"), as evidenced by "Invasive Mite Identification," at [keyslucidcentral.org/keys/v3/mites/Invasive\\_Mite\\_Identification/key/Tetranychinae/Media/Html/Oligonychus.htm](http://keyslucidcentral.org/keys/v3/mites/Invasive_Mite_Identification/key/Tetranychinae/Media/Html/Oligonychus.htm) ("Invasive Mites") and "family Tetranychidae" at [www.thefreedictionary.com/family+Tetranychidae](http://www.thefreedictionary.com/family+Tetranychidae) ("Tetranychidae"), is respectfully traversed.

The Office alleges that it would have been *prima facie* obvious for a person of ordinary skill in the art to apply spiroticlofen to conifers because Fischer discloses spiroticlofen and its use in controlling arachnids, Wachendorff teaches that spiroticlofen is a broad spectrum acaricide, and Weidhaas discloses that spruce mites attack only conifers including spruce and fir. Office Action, p. 9. Further, the Office suggests that it would have been within the skill of an ordinary artisan to optimize the concentration of spiroticlofen applied to crops. Office Action, p. 10. Applicants respectfully disagree.

As discussed above, the acaricidal activity of spiroticlofen in one crop is not indicative of success of acaricidal activity in other crops. Wachendorff does not provide

a person of ordinary skill any guidance on applying spirodiclofen to spruces and firs at a concentration of 0.0048% active ingredient per hectare to 0.0144% active ingredient per hectare. First, Wachendorff's indicates that spirodiclofen (BAJ2740) may be used in citrus, pome fruits, stone fruits, grapes and nuts. Wachendorff does not provide any indication that spirodiclofen may be used in spruces and firs. Second, Wachendorff only provides use concentrations for apples, grapes and citrus. The field performance studies recited in Wachendorff recite the application rate of spirodiclofen in grams of active ingredient per 1000 liters, but do not provide the number of liters of solution applied in a given crop area. Therefore, the Wachendorff provides no information on the concentration of spirodiclofen even in the crops it recites. Accordingly, Wachendorff does not provide any guidance on the concentration of spirodiclofen to be used in spruces and firs. Accordingly, a person of ordinary skill in the art would not have a rationale to modify Wachendorff to arrive at the invention of claim 8.

Fischer does not cure the deficiencies of Wachendorff. Fischer is directed to 3-aryl-4-hydroxy- $\Delta^3$ -dihydroxyfuranone and 3-aryl-4-hydroxy- $\Delta^3$ -dihydrothiophenone derivatives and their use as insecticides, acaricides, herbicides and fungicides. Spirodiflofen (compound Ib-119) is one among the almost 300 compounds explicitly disclosed by Fischer. Fischer, cols. 91-126. Fischer does not guide a person of ordinary skill in the art specifically to compound Ib-119. Further, Fischer does not point one of skill in the art to spruces and firs, as required by claim 8. Instead, Fischer only generally discloses the use of compounds of formula I for controlling "animal pests, particularly insects and arachnids, encountered in agriculture, in forests . . . ." Fischer, col. 127, lines, 30-32. Furthermore, claim 8 recites that the compound of formula (I) is applied at

a concentration of 0.0048% active ingredient per hectare to 0.0144% active ingredient per hectare. Fischer does not provide any guidance on the concentration of spirodiclofen to be employed for acaricidal activity.

Weidhaas does not cure the deficiencies of Wachendorff and Fischer. Applicants submit that the Office has not considered Weidhaas in its entirety. The Office cites Weidhaas because "Weidhaas teaches that spruce mites (*Oligonychus ununguis*) attacks only conifers including spruce and fir (pp. 10, left column)." Office Action, p. 9. While Weidhaas does appear to suggest that the spruce mite only attacks conifers, Weidhaas also indicates that the chemical control of mites is not easy. For example, Weidhaas states that:

As different insects may or may not be controlled effectively by certain pesticides, mites are variably susceptible also. Some insecticides kill insects but not mites, while others kill both. Yet, some insecticides that do not kill spider mites are effective against eriophyid mites.

Weidhaas, p. 14, right hand column, lines 19-34. Therefore, Weidhaas does not guide a person of ordinary skill in the art to the invention of claim 8.

The Office suggests that "it would have been *obvious to try* to control mites of the *Oligonychus* genus with spirodiclofen, because both the genera of *Tetranychus* and *Oligonychus* belong to the same phylogenetic family." Office Action, p. 10 (emphasis added). Applicants respectfully disagree. The Manual of Patent Examining Procedure ("M.P.E.P.") states that "(E) 'Obvious to try' [requires] choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success." M.P.E.P. § 2141. Applicants submit that the Office has not identified a "a finite number of identified, predictable solutions, with a reasonable expectation of success." Wachendorff only provides use concentrations for spirodiclofen in apples, citrus and grapes.

Weidhaas indicates that a variety of mites are common pests on a number of different crops. Fischer specifically recites almost 300 compounds and lists a variety of pests that these compounds may be applied against. Combining the disclosures of Wachendorff, Fischer and Weidhaas leads to very large number of possible solutions that would not have a reasonable expectation of success. Therefore, Wachendorff, Fischer and Weidhaas do not lead a person of ordinary skill in the art to the invention of claim 8.

Under *KSR International Co. v. Teleflex, Inc.*, 127 S.Ct. 1727, 82 U.S.P.Q. 2d 1385, 1741 (USSC) (2007), "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art." Rather, there must be a reason or rationale behind an obviousness determination and "this analysis should be made explicit." *Id.* Hence, under KSR, the mere fact that the individual elements, i.e., method of using spirodiclofen as an acaricide, and the susceptibility of conifers to the spruce mite, were independently known in the art does not render present claim 8 obvious. The Office is using impermissible hindsight analysis to piece together isolated elements taken from Wachendorff, Fischer and Weidhaas, using Applicants' disclosure as a blueprint to arrive at the presently claimed method. The Office has not provided a sufficient reason as to why a person of ordinary skill in the art would have combined isolated elements from the cited art to arrive at the invention of claim 8.

Applicants are aware of the flexible approach for establishing obviousness set out in *KSR*. However, as cautioned by Judge Rader in a post-KSR decision in *In re Kubin*, 561 F.3d 1351 (Fed. Cir. 2009), "where a defendant merely throws metaphorical darts at a board filled with combinatorial prior art possibilities, courts should not succumb to



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hindsight claims of obviousness." (561 F.3d at 1359.) The Office has not provided any reason for a person of ordinary skill in the art to specifically select compound Ib-119 from Fischer and the spruce crop from Weidhaas from among all the available combinations of acaricides and crops in order to arrive at the method of instant claim 8.

Applicants respectfully request that the rejection of claim 8 under 35 U.S.C. § 103(a) be withdrawn.


***Conclusion***

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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